

Study Guide

For use with pages 275–279

GOAL Write and solve proportions.**VOCABULARY**A **proportion** is an equation that states that two ratios are equivalent.**EXAMPLE 1** Solving a Proportion Using Equivalent RatiosSolve the proportion $\frac{7}{10} = \frac{x}{50}$.

(1) Compare denominators.

(2) Find x .

$$\frac{7}{10} \xrightarrow{\times 5} \frac{x}{50}$$

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Answer: Because $7 \times 5 = 35$, $x = 35$.**Exercises for Example 1**

Use equivalent ratios to solve the proportion.

1. $\frac{15}{8} = \frac{x}{24}$

2. $\frac{8}{11} = \frac{x}{44}$

3. $\frac{x}{34} = \frac{3}{17}$

4. $\frac{x}{39} = \frac{12}{13}$

EXAMPLE 2 Solving a Proportion Using AlgebraSolve the proportion $\frac{x}{15} = \frac{27}{45}$. Check your answer.

$$\frac{x}{15} = \frac{27}{45}$$

Write original proportion.

$$15 \cdot \frac{x}{15} = 15 \cdot \frac{27}{45}$$

Multiply each side by 15.

$$x = \frac{405}{45}$$

Simplify.

$$x = 9$$

Divide.

✓ **Check:** $\frac{x}{15} = \frac{27}{45}$

Write original proportion.

$$\frac{9}{15} = \frac{27}{45}$$

Substitute 9 for x .

$$\frac{3}{5} = \frac{3}{5} \checkmark$$

Simplify. Solution checks.

Exercises for Example 2

Use algebra to solve the proportion.

5. $\frac{x}{15} = \frac{4}{10}$

6. $\frac{x}{12} = \frac{9}{18}$

7. $\frac{15}{20} = \frac{x}{16}$

8. $\frac{12}{15} = \frac{x}{35}$

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EXAMPLE 3 Writing and Solving a Proportion

For every \$25 that you earn, you save \$15. How much of the \$70 that you earned at your after-school job this week will you save?

Solution

First, write a proportion involving two ratios that compare the amount you save to the amount you earn.

$$\frac{15}{25} = \frac{x}{70}$$

← Amount saved
← Amount earned

Then, solve the proportion.

$$70 \cdot \frac{15}{25} = 70 \cdot \frac{x}{70} \quad \text{Multiply each side by 70.}$$

$$\frac{1050}{25} = x \quad \text{Simplify.}$$

$$42 = x \quad \text{Divide.}$$

Answer: You will save \$42 out of the \$70 you earned this week.

Exercise for Example 3

9. At a bookstore, 3 novels cost \$17.97. How many novels can you buy for \$29.95?